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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/686,082 | 10/14/2003 | Bruno Ghyselen | 4717-11400 | 7267 |

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| EXAMINER | |
|---|---|
| SCHILLINGER, LAURA M | |
| ART UNIT | PAPER NUMBER |
| 2813 | |

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| Office Action Summary | Application No. | Applicant(s) |  |
|---|---|---|---|
|  | 10/686,082 | GHYSELEN ET AL. |  |
|  | **Examiner** | **Art Unit** |  |
|  | Laura M. Schillinger | 2813 |  |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *4/21/04; 10/14/03*.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's arguments pertaining to the restriction of claim 20 is considered persuasive and the restriction requirement is hereby withdrawn.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Tong et al ('987).

Tong teaches the following claimed limitations as cited below:

1. A preventive treatment method for a multilayer semiconductor structure that includes a support substrate, at least one' intermediate layer and a surface layer in which the surface layer is to be subjected to a subsequent chemical treatment, which method comprises forming a protective layer between the intermediate layer and the surface layer, the protective layer being

made from a material chosen to be sufficiently resistant to the chemical treatment to protect the intermediate layer from chemical attack (Col.5, lines: 30-40 and Fig.3C (30-32)).

2. The method of claim 1 which further comprises forming the multilayer semiconductor structure by bonding a donor substrate to the support substrate and then transferring at least the surface layer from the donor substrate to the support substrate by a layer transfer technique (Col.6, lines: 55-65).

3. The method of claim 2 which further comprises providing the intermediate and protective layers on a surface of at least one of the support substrate and the donor substrate before bonding (Col.5, lines: 5-15).

4. The method of claim 2 which further comprises providing the intermediate layer on a bonding surface of one of the substrates and the protective layer is provided on a bonding surface of the other substrate before bonding (Fig.4E).

5. The method of claim 2 wherein the surface layer is transferred by providing a weakened zone in the donor substrate at a depth sufficient to define the surface layer, bonding; the surface layer of the donor substrate to the protective layer and then detaching the surface layer from the donor substrate (Col.8, lines: 30-35).

6. The method of claim 5 wherein the weakened zone is provided by at least one of implanting atomic species in the donor substrate to a predetermined depth, or by providing a porous layer in the donor substrate (Col.9, lines: 30-40).

7. The method of claim 1 which further comprises forming the multilayer semiconductor structure by bonding a donor substrate to the protective layer and then obtaining the surface layer by at least one of chemically etching, grinding, polishing, using CMP, or abrading the donor substrate (Col.13, lines: 55-65).

8. The method of claim 1 wherein the structure is a semiconductor-on-insulator structure (Col.9, lines: 45-55).

9. The method of claim 8 wherein the intermediate layer at least partly forms an insulating layer of the structure (Col.5, lines: 5-15 and 30-40).

10. The method of claim 9 wherein at least a part of the intermediate layer is made of $SiO_2$ (Col.5, lines: 5-15 and 30-40).

11. The method of claim 9, which further comprises forming the intermediate layer by oxidation (Col.5, lines: 5-15 and 30-40).

12. The method of claim 9 wherein the protective layer forms at least a part of the insulating layer of the structure (Col.5, lines: 5-15 and 30-40)..

13. The method of claim 1 wherein the protective layer is made from a nitride material (Col.5, lines: 5-15 and 30-40)..

14. The method of claim .13 wherein the protective layer is made of $Si_3N_4$ or SiON (Col.5, lines: 5-15 and 30-40)..

15. The method of claim 1 wherein the multilayer semiconductor structure is formed by bonding a transfer structure to the support substrate (Col.6, lines: 55-65).

16. The method of claim 15 wherein the protective layer is formed by depositing a nitride on a bonding surface of the transfer structure or the support substrate (Col.5, lines: 5-15 and 30-40)..

17. The method of claim 15, which further comprises providing the multilayer structure with a weakened zone between two layers, and providing at least one of the two layers with a rough surface (Col.9, lines: 30-45).

18. The method of claim 17 which further comprises utilizing a chemical treatment to roughen the surface of at least one of the two layers before bonding (Col.5, lines: 5-15 and 30-40)..

19. The method of claim 1 wherein the chemical treatment is based on hydrofluoric acid (Col.5, lines: 5-15 and 30-40).

20. In a preventive treatment method for a multilayer semiconductor structure hating a support substrate, at least one intermediate layer and a surface layer in which the surface layer is to be subjected to a subsequent chemical treatment, the improvement comprising forming a protective layer between the intermediate layer and the surface layer, the protective layer being made from a material chosen to sufficiently resistant to the chemical treatment to protect the intermediate layer from chemical attack(Col.5, lines: 30-40 and Fig.3C (30-32)).

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura

Laura M Schillinger
Primary Examiner
Art Unit 2813

06/15/05